

REMARKS

The Examiner's Action dated September 6, 1989, has been received, and its contents carefully noted.

The rejection of claim 22 under 35 U.S.C. 112, second paragraph, is respectfully traversed because it is believed that claim 22, in its original form, is clear and definite. Claim 22 refers, in fact, to "said conductor structure component" and claim 21 recites only a single "conductor structure component" which is part of the upper structure. It is therefore submitted that claim 22 is not ambiguous as to the structure to which the component belongs.

[The rejection of claims 5-7, 10 and 13 under 35 U.S.C. 112, fourth paragraph, is also traversed. In view of this rejection, claims 5 and 6 have been amended to be more clearly directed to structure. While it is correct that the identification of a layer as being "electrolytically plated" or "electrolessly plated" is connected with the process by which the layer is formed, limitations of this type can correctly be construed as structural limitations since a layer of each type will have specific physical characteristics which result from the manner in which they are formed. Thus, in this respect, the limitations in question are similar to limitations such as "ground in place", "etched", and "welded", all of which have been held to be capable of construction as structural limitations. In re Garnero, 162 U.S.P.Q. 221, 223 (C.C.P.A., 1969).

Indeed, this reasoning is particularly applicable to the present application, which is based on the discovery that when a conductor for a semiconductor device is provided with an electroplated or electrolessly plated layer, the resulting conductor structure will behave, particularly during subsequent fabrication steps, in a manner distinctly different from conductor structures not having such plating layers.

Similar reasoning applies to claim 10 which simply, for the sake of completeness, identifies those types of electrolytic deposition which yield an electroplated layer having the desired behavior.

On the other hand, claim 13, in addition to specifying that the layer is electrolessly deposited, identifies the composition of the layer, which is clearly a structural limitation. It is well recognized that the presence of a method limitation in an article claim does not, by itself, render that claim defective. Ex parte Lindberg, 157 U.S.P.Q. 606 (P. O. Bd. App., 1967).

Accordingly, it is requested that the rejection of claims 5-7, 10 and 13 under 35 U.S.C. 112 be reconsidered and withdrawn.

The rejection of claims 1-6, 7, 10, 13 and 20 as being anticipated by McDavid is respectfully traversed. As has already been noted above, a significant contribution of the present invention resides in the provision of an electroplated or electrolessly plated metal plating layer disposed on and adhering to a conductive layer of a conductor structure in a

semiconductor device. The advantages which flow from the provision of such a metal plating layer are described in the present specification, particularly at page 12, lines 14-15; page 13, lines 3-7; page 16, line 25 to page 17, line 8; page 19, lines 12-19; page 21, line 21 to page 22, line 15; and page 29, lines 9-14.]

[The U.S. Patent to McDavid, on the other hand, is concerned with reducing contact resistance and wiring resistance and with improving bonding properties by providing a multiple-level refractory metal structure composed of layers of WSi_2 -WMo-W-Au at the contact regions. According to the disclosure presented in this reference, each layer is produced by a coating or deposition process and there is absolutely no disclosure in this reference of the use of a plating operation.]

Since it may be that this rejection was based on a broad interpretation of the term "metal plating layer" originally employed in claim 1, claims 1 and 21 have been amended to specify that the metal plating layer is an electroplated or electrolessly plated layer, thereby clearly distinguishing over the disclosure of McDavid.

Similarly, the rejection of claim 21 as anticipated by Sasaki is traversed, claim 21, as now amended, clearly defining a structure which is not disclosed in that reference.

[In the discussion of this rejection, the Examiner refers to the layer 12b as a metal plating layer. In point of fact, layer 12b is constituted by polyacetylene into which AsF_5 ions are implanted. It is submitted that such a layer cannot

be considered to correspond to "an electroplated or electrolessly plated metal plating layer".]

Accordingly, it is requested that the rejections discussed above be reconsidered and withdrawn.

Similarly, the prior art rejections of claims 8, 9 and 11 are traversed for the reason that these claims depend from claim 1 and the additional applied references include no disclosure which supplies the deficiencies of McDavid.

[Neither the Howard publication nor the Baudrant, et al., patent provides any disclosure of the formation of a layer by electroplating or electroless plating. Howard discloses a structure formed by sandwiching a metal nitride between an Al-Cu layer, while Baudrant, et al., discloses a structure in which $TaSi_2$ is deposited on source and drain regions and a gate electrode.]

The rejections of claims 12 and 16 are traversed because none of the references applied in support of those rejections discloses or suggests the provision of an electroplated or electrolessly plated metal layer on a conductor structure.

[Similarly, the rejections of claims 14, 18 and 19 are traversed because the additional applied reference, the U.S. Patent to Brasen, et al., also fails to disclose the concept of providing an electroplated or electrolessly plated metal layer. What Brasen, et al., does disclose is a structure in which layers of amorphous titanium and amorphous semiconductor material are formed as a lamination under an Al-Cu layer.]

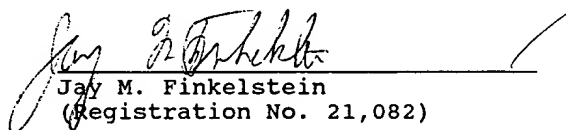
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In view of the foregoing, it submitted that the claims now in the application clearly distinguish over the teachings of the applied references and it is therefore requested that the rejections of record be reconsidered and withdrawn, that all of the claims now in the application be allowed and that the application be found in allowable condition.

If for any reason, the Examiner finds the application in other than in condition for allowance, he is respectfully requested to call the undersigned attorney at the Washington, D.C. telephone number 223-5700 to discuss the steps necessary for placing the application in condition for allowance.

September 1, 1989

Respectfully submitted,


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